

BRYAM ASTUDILLO

Stanford, CA, 94305

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STANFORD UNIVERSITY

PhD in Civil Engineering (Structural Engineering)

2022-2025

GPA: 3.95/4.00

OREGON STATE UNIVERSITY

MS in Civil Engineering (Structural Engineering)

2020-2022

GPA: 3.96/4.00

UNIVERSIDAD DE CUENCA

BS in Civil Engineering

2013 - 2018

GPA: 93/100

MERITS AND AWARDS

Shah Fellowship on Catastrophic Risk.

2023 – 2024

Stanford University

*USD 120,000*Fulbright Scholarship for Foreign Students to pursue graduate studies
in the US.

2020 – 2022

Fulbright Ecuador / U.S. Department of State

USD 30,000

Honors Program Student

2016 – 2018

Universidad de Cuenca, Ecuador.

Merit-based Scholarship for outstanding academic performance in Civil
Engineering

2015 – 2017

Universidad de Cuenca, Ecuador.

Merit-based Scholarship for the top-ranked student in Computer
Science

2012 – 2013

Universidad del Azuay, Ecuador.

PUBLICATIONS

MANUSCRIPTS IN PREPARATION

- J7.** Multimodal capacity design and collapse assessment of Strongback Braced Frames.
Astudillo B., Simpson B.
2025. Manuscript in preparation.
- J6.** Seismic performance and economic loss assessment of specimens employing spines and force-limiting connections: A parametric study.
Astudillo B., Simpson B., Fahnestock, L., Sause, R., Ricles, Duke, J.
2025. Manuscript in preparation.
- J5.** Experimental investigation of Full-Scale Specimens with Lateral-Force-Resisting Systems Containing Spines and Force-Limiting-Connections tested at E-Defense shake table.
Astudillo, B., Simpson, B., Fahnestock, L., Sause, R., Ricles, J., Kurata, M., Okazaki, T., Kawamata, Y., Tao, Z., Duke, J., Qie, Y., Rivera, D.
2025. Manuscript in preparation.

JOURNAL PUBLICATIONS

- J4.** Modeling uncertainty of specimens employing spines and force-limiting connections tested at E-defense shake table.
Astudillo, B., Rivera, D., Simpson, B., Fahnestock, L., Sause, R., Ricles, J., Kurata, M., Okazaki, T., Kawamata, Y., Tao, Z., Duke, J., Qie, Y.
2023. *Earthquake Engineering & Structural Dynamics*, Volume 52, Issue 14.
<https://doi.org/10.1002/eqe.3976>
- J3.** Seismic performance of steel moment frames considering the effects of column-base hysteretic behavior and gravity framing system.
Torres-Rodas, P., Flores, F., Pozo, S., & **Astudillo, B.**
2021. *Soil Dynamics and Earthquake Engineering*, 144, 106654.
<https://doi.org/10.1016/j.soildyn.2021.106654>.
- J2.** Objective Phenomenological Constitutive Law for Collapse Analyses in Distributed Plasticity Steel-Frame Models.
Pozo, S., **Astudillo, B.**, Samaniego, E., Flores, F.
2021. *Journal of Structural Engineering*. 147, 04021057.
[https://doi.org/10.1061/\(ASCE\)ST.1943-541X.0003027](https://doi.org/10.1061/(ASCE)ST.1943-541X.0003027)
- J1.** Effective Modeling of Special Steel Moment Frames for the Evaluation of Seismically Induced Floor Accelerations.
Flores, F., **Astudillo, B.**, & Pozo, S.
2021. *Journal of Structural Engineering*, 147(1), 04020311.
[https://doi.org/10.1061/\(ASCE\)ST.1943-541X.0002851](https://doi.org/10.1061/(ASCE)ST.1943-541X.0002851)

PEER-REVIEWED CONFERENCE PROCEEDINGS

- C12.** Higher-mode response of braced frames with elastic spines subjected to modal pushover analysis.
Astudillo, B., Simpson, B.
2024. In *Proceedings of the 18th WCEE World Conference on Earthquake Engineering*, Milan, Italy.

- C11.** Numerical response estimations of a Frame-Spine-FLC system prior to experimental dynamic testing.
Astudillo, B., Rivera, D., Simpson, B., Fahnestock, L., Sause, R., Ricles, J., Kurata, M., Okazaki, T., Kawamata, Y., Tao, Z., Duke, J., Qie, Y.
2022. In Proceedings of the 10th International Conference on the Behaviour Of Steel Structures In Seismic Areas, Timisoara, Romania.
- C10.** Design and Performance Comparison of Strongback Systems and Typical Chevron BRB Frames.
Astudillo, B., Panian, L., Simpson, B.
2022. In Proceedings of the 12th National Conference in Earthquake Engineering, Earthquake Engineering Research Institute, Salt Lake City, UT.
- C9.** U.S.-Japan collaboration for shake table testing of a Frame-Spine system with Force-Limiting Connections.
Fahnestock, L., Sause, R., Ricles, J., Simpson, B., Kurata, M., Okazaki, T., Kawamata, Y., Tao, Z., Duke, J., Rivera, D., **Astudillo, B.**, Qie, Y.
2021. In Proceedings of the 17th WCEE World Conference on Earthquake Engineering, Sendai, Japan.
- C8.** Full-Scale Seismic Stability Evaluation of a Frame-Spine System with Force-Limiting Connections.
Fahnestock, L., Sause, R., Ricles, J., Simpson, B., Kurata, M., Okazaki, T., Kawamata, Y., Tao, Z., Duke, J., Rivera, D., **Astudillo, B.**, Qie, Y.
2021. In Proceedings of the Annual Stability Conference Structural Stability Research Council. Louisville, Kentucky.
- C7.** An Evaluation Of The Current Approaches And Recommendations For More Rational Approaches For Assessing The Seismic Torsional Stability Of Buildings.
Astudillo, B., Flores, F., Pozo, S., Charney, F.,
2020. In Proceedings of the XI International Conference on Structural Dynamics, Athens, Greece, pp. 4590–4600. <https://doi.org/10.47964/1120.9373.19605>
- C6.** Parametric Analysis And Comparison Of Models Used In The Analysis Of Steel Structures.
Astudillo, B., Pozo, S., Flores, F.,
2020. In Proceedings of the XI International Conference on Structural Dynamics, Athens, Greece, pp. 3655–3670. <https://doi.org/10.47964/1120.9300.19718>
- C5.** Gravity System Energy Dissipation Contribution In Seismic Performance Of Special Steel Moment Frames.
Flores, F., Pozo, S., **Astudillo, B.**, Vazquez, J.
2020. In Proceedings of the XI International Conference on Structural Dynamics, Athens, Greece, pp. 4023–4038. <https://doi.org/10.47964/1120.9329.19506>
- C4.** Regularization Method To Include Material Softening In Fiber Beam-Column Elements For Seismic Performance Assessment Of Steel Frames.
Pozo, S., **Astudillo, B.**, Samaniego, E., Flores, F.,
2020. In Proceedings of the XI International Conference on Structural Dynamics, Athens, Greece, pp. 93–107. <https://doi.org/10.47964/1120.9008.19587>
- C3.** Sensitivity Of Special Steel Moment Frames To The Influence Of Column-Base Hysteretic Behavior Including Gravity Framing System.
Torres-Rodas, P., Flores, F., **Astudillo, B.**, Pozo, S.,
2020. In Proceedings of the XI International Conference on Structural Dynamics, Athens, Greece, pp. 3629–3642. <https://doi.org/10.47964/1120.9298.19279>
- C2.** Level of Detail Required to Model Special Steel Moment Frames to Evaluate Floor Accelerations in Nonstructural Components.
Flores F., **Astudillo, B.**, Barrera, D., Jerves, R., Martinez, I., Pozo, S.
2019. In Proceedings of Structures Congress 2019. pp. 426–437.
<https://doi.org/10.1061/9780784482230.040>

C1. Structural behavior checks prior to performing nonlinear dynamic analysis.

Flores, F., Charney, F., Pozo, S., & **Astudillo, B.**

2018. In Proceedings of the 11th US National Conference on Earthquake Engineering (11NCEE). Los Angeles, CA.

DISSERTATION/THESIS

D3. Analysis and Design of Strongback Braced Frames.

Astudillo, B.

2025 (expected date). PhD dissertation. Stanford University, Stanford, CA.
Advisor: Barbara Simpson, Ph.D.

D2. Numerical Characterization and Modeling Uncertainty of Frame-Spine and Frame-Spine-FLC Full-Scale Specimens Tested at E-Defense Shake-Table.

Astudillo, B.

2022. Master thesis. Oregon State University, Corvallis, OR.
Advisor: Barbara Simpson, Ph.D.

D1. Modeling and Performance Analysis of a Steel Structure, considering deteriorations for collapse prediction.

Astudillo, B.

2018. Undergraduate Thesis, Universidad de Cuenca.
Advisor: Francisco Flores, Ph.D.

INVITED PRESENTATIONS (WITH NO ACCOMPANYING PUBLICATION)

P6. NHERI Computational Symposium. UCLA. Los Angeles, CA.	2024
P5. PEER Annual Meeting. UC Berkeley. Berkeley, CA.	2023
P4. EMI23. Engineering Mechanic Institute. Atlanta, GA.	2023
P3. School of Sustainability Mini-Conference. Stanford University. Stanford, CA.	2023
P2. Blume Center Affiliates and Alumni Meeting. Stanford University. Stanford, CA.	2022
P1. EERI Annual Meeting. Virtual.	2021

WORK EXPERIENCE

STANFORD UNIVERSITY

Graduate Teaching Assistant

Winter 2025

Course: CEE 282 - Nonlinear Structural Analysis. I will assist in teaching:

- Introduction to methods of geometric and material nonlinear analysis.
- Modeling approaches for framed structures.
- Computer implementation and applications of nonlinear structural analysis methods.

STANFORD UNIVERSITY

Graduate Research Assistant

2022 - 2025

Research Project: Design and Analysis of Strongback Braced Frames and Frame-Spine Systems for Earthquake Resilience.

- Proposed a design workflow to address multi-modal capacity design in Strongback Braced Frames.
- Evaluated the probability of collapse using FEMA P-695 and High-Performance Computing resources.
- Collaborated with industry advisors to implement a practical design approach into AISC 341.
- Developed Python packages for design and performance-based earthquake engineering assessments.

TIPPING STRUCTURAL ENGINEERS. BERKELEY, CA.

Structural Engineering Intern

Summer 2021

Project: Internal research and development.

- Designed 4-, 8-, and 16-stories archetypes for BRBF and Mast frames.
- Performed nonlinear response history analysis using Perform3D.

OREGON STATE UNIVERSITY. CORVALLIS, OR.

Graduate Research Assistant

2020 - 2022

Research Project: Frame-Spine System with Force-Limiting Connections for Low-Damage Seismic Resilient Buildings. US-Japan Collaborative Research.

- Collaborated on the full-scale shake table experiment of a hospital building at the E-Defense facility in Japan.
- Estimated the building response using nonlinear dynamic analysis and uncertainty quantification methods.
- Conducted structural health monitoring from instrumentation in the building.

UNIVERSIDAD DE CUENCA. ECUADOR

Research Engineer

2018 - 2020

Projects: 1) Evaluation of floor accelerations on non-structural components, 2) accidental torsion on structures, and 3) influence of modeling base column connections.

- Optimized the modeling process for structures using OpenSees in 2D and 3D.
- Performed nonlinear static and dynamic analysis with state-of-the-art techniques.
- Processed and conducted statistical analysis of numerical results.

UNIVERSIDAD DEL AZUAY. ECUADOR

Research Engineer

2019 - 2020

Project: Influence of gravity column connections on the performance of buildings.

- Developed mathematical models varying shear-tab hysteretic behavior to quantify the effects of shear-tab behavior on the overall performance.
- Post-processed results to quantify energy dissipation of connections.
- Participated in seminars to motivate new students to participate in research activities.

UNIVERSIDAD DEL AZUAY. ECUADOR

Invited instructor 2019

Course: Matrix Analysis of Structures

- Developed an introductory course in programming for structural engineering analysis and taught it to more than 100 students.

UNIVERSIDAD DE CUENCA. ECUADOR

Undergraduate Teacher Assistant 2014 - 2017

Courses: Differential Calculus (4 semesters) and Linear Algebra (2 semesters)

- Prepared problem sets for the courses.
- Conducted recitations and problem-solving workshops with more than 300 students.

TRAVEL GRANTS

NHERI-NIED/E-Defense Travel Award. Kobe, Japan.	2025
EERI Annual Meeting Registration Grant. San Francisco, CA.	2023
EERI Registration Grant. 12 th National Conference on Earthquake Engineering. Salt Lake, UT.	2022
EERI Registration Grant. EERI Annual meeting. Online.	2021
SEI Student Scholarship to participate at Structures Congress 2019. American Society of Civil Engineers - Structural Engineering Institute. Orlando, FL.	2019

AFFILIATIONS AND SERVICE

Guest of the AISC Task Committee 9 (Seismic Systems). 2023-present
American Institute of Steel Construction (AISC)

- Assist in the research efforts to address the Strongback Braced Frames in future versions of AISC 341 Seismic Provisions for Structural Steel Buildings.

Student Committee Assistant Director. 2021-2023
Pacific Earthquake Engineering Research Center (PEER).

- Started the Meet the PEER Students Series to promote communication between students across PEER institutions.
- Organized PEER Pitches to showcase student research. One was hosted at the PEER Research workshop in 2022 and another at the PEER Annual Meeting in 2023.

Board Member for the Student Executive Committee. 2016-2017
Universidad de Cuenca.

- Represented the School of Civil Engineering in the University student body organization.
- Debated and voted on the student body's position regarding the new process for university admissions.

Research Student. Blume Earthquake Engineering Center
Student member. Earthquake Engineering Research Institute (EERI)
Student member. American Society of Civil Engineers (ASCE)
Student member. Structural Engineers Association of Northern CA (SEAONC)

SKILLS

Programming & Software Development: Advanced proficiency in **MATLAB** and **Python** for scripting, algorithm development, and automating structural analysis workflows. Extensive experience in high-performance computing (**HPC**) for running intensive simulations, including nonlinear dynamic analyses. Strong use of **Git** for code management and version control across collaborative projects. Proficient in **JavaScript** for developing web applications to enhance structural analysis workflows, supporting both research and educational applications.

Numerical Modeling & Simulation: Strong foundation in the dynamic behavior of structures, with an emphasis on seismic response analysis. Advanced skills in nonlinear modeling, understanding complex structural behavior, and assessing performance using **OpenSees**. Skilled in using industry-standard tools like **SAP2000**, **ETABS**, and **Perform3D** for structural design, analysis, and performance-based evaluation.

Seismic Hazard & Risk Analysis: Deep understanding of seismic hazard assessment, risk quantification, and application of probabilistic approaches to structural design. Proficient in evaluating hazard risk and risk mitigation strategies. Experienced in applying Performance-Based Earthquake Engineering (**PBEE**) principles to design and evaluate structures for enhanced seismic resilience. Skilled in assessing structural and non-structural components to meet performance objectives under varying earthquake scenarios.

Seismic Design of Steel Structures: Expertise in designing and analyzing steel structures to meet seismic code requirements, focusing on ductility, energy dissipation, and resilience. Experience with seismic design methods tailored for steel frames, including buckling-restrained braced frames (**BRBFs**) and strongback systems.

Decision-Making Under Uncertainty & Structural Reliability: Competent in applying principles of decision-making under uncertainty to assess structural reliability and risk. Familiarity with probabilistic methods, uncertainty quantification, and risk-based design strategies for developing robust and reliable structures.